

Vibrational Decihertz (dHz), Centihertz (cHz), Millihertz (mHz), Microhertz (μ Hz), Nanohertz (nHz), Picohertz (pHz), Femtohertz (fHz), Attohertz (aHz), Zeptohertz (zHz) and Yoctohertz (yHz) Imaging and Spectroscopy Comparative Study on Malignant and Benign Human Cancer Cells and Tissues under Synchrotron Radiation

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Abstract

In the current study, we have experimentally and computationally presented vibrational decihertz (dHz), centihertz (cHz), millihertz (mHz), microhertz (μ Hz), nanohertz (nHz), picohertz (pHz), femtohertz (fHz), attohertz (aHz), zeptohertz (zHz) and yoctohertz (yHz) imaging and spectroscopy comparative study on malignant and benign human cancer cells and tissues under synchrotron radiation. It can be concluded that malignant human cancer cells and tissues have gradually transformed to benign human cancer cells and tissues under synchrotron radiation with the passing of time. (**International Journal of Biomedicine**, 2017;7(4):335-340.)

Key Words: spectroscopy • synchrotron radiation • cancer cells • malignant cells • benign cells

Introduction

In the current study, we have experimentally and computationally presented vibrational decihertz (dHz), centihertz (cHz), millihertz (mHz), microhertz (μ Hz), nanohertz (nHz), picohertz (pHz), femtohertz (fHz), attohertz (aHz), zeptohertz (zHz) and yoctohertz (yHz) imaging and spectroscopy comparative study on malignant and benign human cancer cells and tissues under synchrotron radiation [1–100]. In this regard, we have experimentally investigated and compared malignant human cancer cells and tissues before and after irradiating of synchrotron radiation using vibrational decihertz (dHz), centihertz (cHz), millihertz (mHz), microhertz (μ Hz), nanohertz (nHz), picohertz (pHz), femtohertz (fHz), attohertz (aHz), zeptohertz (zHz) and yoctohertz (yHz) imaging and spectroscopy. It is clear that malignant human cancer cells and tissues have gradually transformed to benign human cancer cells and tissues under synchrotron radiation with the passing of time (Figure 1).^(1–100)

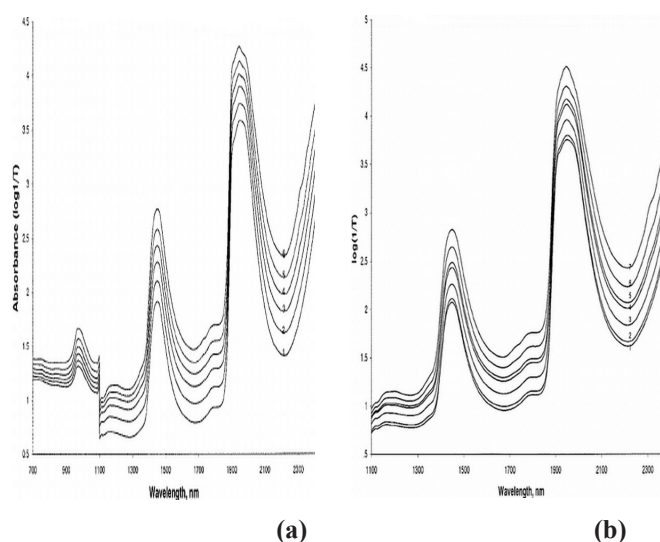


Fig. 1. Vibrational decihertz (dHz), centihertz (cHz), millihertz (mHz), microhertz (μ Hz), nanohertz (nHz), picohertz (pHz), femtohertz (fHz), attohertz (aHz), zeptohertz (zHz) and yoctohertz (yHz) spectra of malignant human cancer cells and tissues (a) before and (b) after irradiating of synchrotron radiation.^(1–100)

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Furthermore, we have computationally simulated this transformation process according to the passing of time (Figure 2) and also different distributions of human cancer cells and tissues (Figure 3) using MATLAB, respectively.⁽¹⁻¹⁰⁰⁾

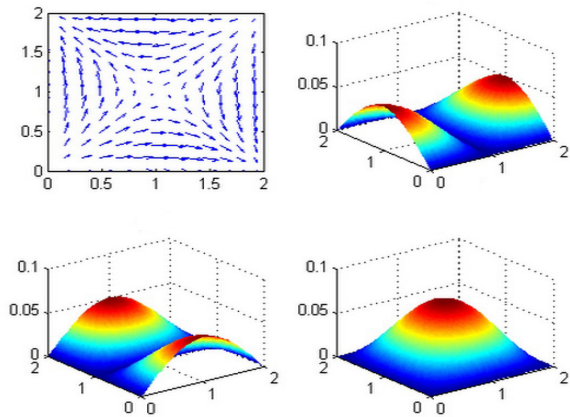


Fig. 2. Simulation of transformation process of malignant human cancer cells and tissues to benign human cancer cells and tissues under synchrotron radiation with the passing of time using MATLAB.⁽¹⁻¹⁰⁰⁾

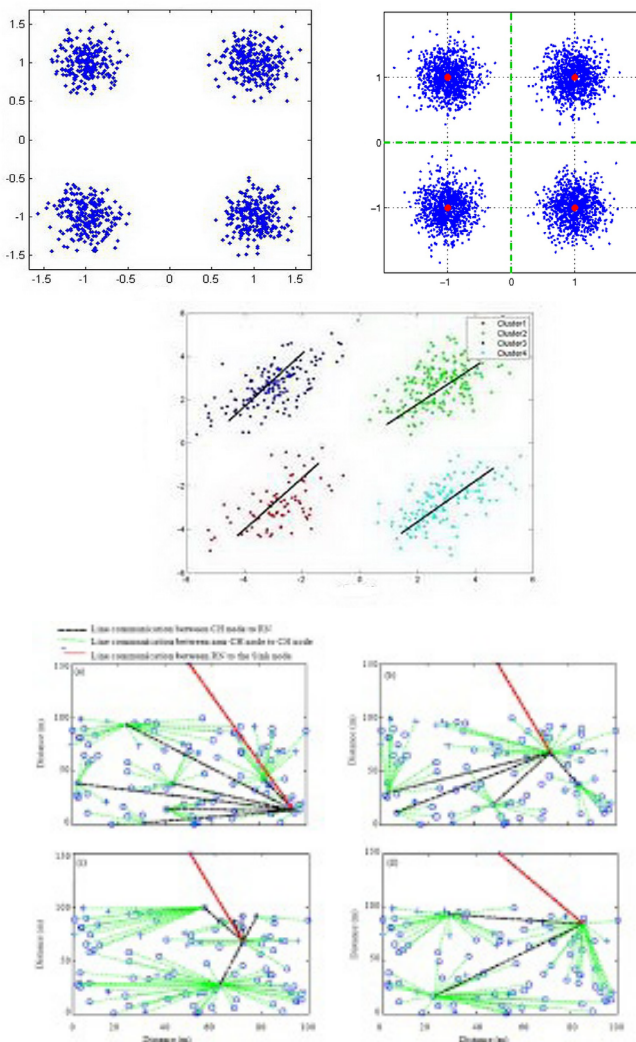
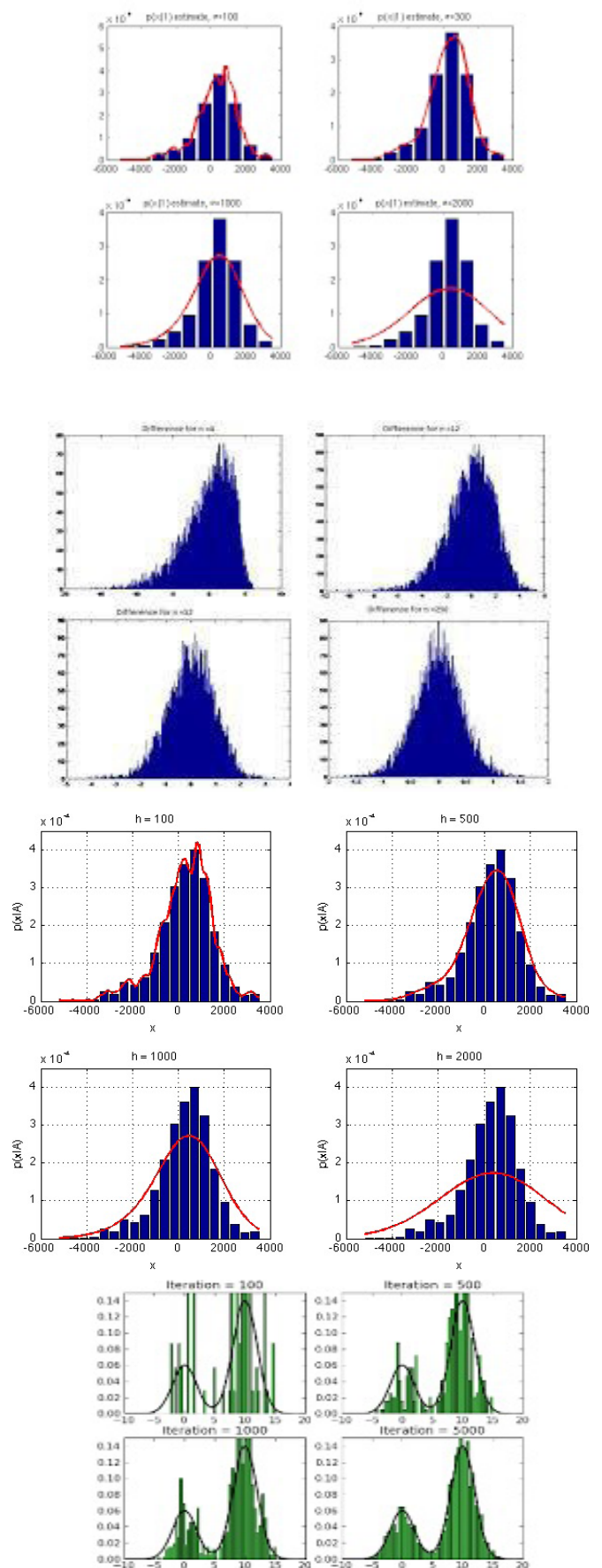


Fig. 3. Different simulations of transformation process of malignant human cancer cells and tissues to benign human cancer cells and tissues under synchrotron radiation according to the different distributions of human cancer cells and tissues using MATLAB.⁽¹⁻¹⁰⁰⁾



It should be noted that different simulations of transformation process of malignant human cancer cells and tissues to benign human cancer cells and tissues under synchrotron radiation according to the different distributions of human cancer cells and tissues using MATLAB (a) before irradiating of synchrotron radiation (top left), after (b) 10 days (top right), (c) 20 days (left bottom) and (d) 30 days (right bottom) irradiating of synchrotron radiation was investigated (Figure 3).⁽¹⁻¹⁰⁰⁾ It can be concluded that malignant human cancer cells and tissues have gradually transformed to benign human cancer cells and tissues under synchrotron radiation with the passing of time (Figures 1-3).⁽¹⁻¹⁰⁰⁾

Conflicts of interest

There are no commercial interests or conflicts of interest to declare.

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